

Dispersed Soluble Organic Matters – an Important Direct Source for Natural Gas in Superimposed Basins

Liu, Wenhui, Bo Gao, and Dianwei Zhang, Exploration and Production Research Institute, SINOPEC, Beijing, China

Natural gas has a great variety of biogenetic and abiogenetic origins, of which biogenetic origin is the main origin for the natural gas of commercial exploitation. As for the biogenetic natural gas, the sapropel organic and humic organic matters can generate natural gas directly. The liquid product (soluble organic matter) formed during the evolution of kerogen can also generate gas by thermal cracking. Simulation experiments show that although the kerogen can generate a great deal of hydrocarbons, with increasing thermal evolution degree, the ability in hydrocarbon generating of kerogen decreases. At the high evolution stage, the hydrocarbon gas is mostly generated from the scattered or accumulated soluble organic matters derived from kerogen early, and the hydrocarbon generating ability of kerogen is weak. Moreover, because of the weaker mineral catalysis and the need for high temperature and lower conversion rate, the geological condition required to produce thermogenic gas from hydrocarbons of accumulated soluble (e.g. oil pool) is extremely rigorous even though the crude oil can generate hydrocarbon gas in the course of its cracking. However, the scattered soluble organic matters (SSOM) preserved in the reservoir rocks and along migration pathways have enormous hydrocarbon generating potential because the catalytic inorganic mineral contacted with them can greatly lower the activation energy and increase the transformation efficiency of hydrocarbon generation. SSOM distributes in a wide range, and is one of important direct sources of natural gas in the superimposed basin.